

**IN THE UNITED STATES BANKRUPTCY COURT  
DISTRICT OF DELAWARE**

In re:	)	
	)	Chapter 11
RS FIT NW LLC,	)	
	)	Case No. 20-11568 (KBO)
Debtor.	)	
	)	(Jointly Administered)
	)	
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24 HOUR FITNESS WORLDWIDE, INC.,	)	
	)	
Plaintiff,	)	
	)	
v.	)	
	)	
CONTINENTAL CASUALTY COMPANY;	)	Adv. Pro. No. 20-51051 (KBO)
ENDURANCE AMERICAN SPECIALTY	)	
INSURANCE COMPANY; STARR SURPLUS	)	
LINES INSURANCE COMPANY; ALLIANZ	)	
GLOBAL RISKS US INSURANCE COMPANY;	)	
LIBERTY MUTUAL INSURANCE COMPANY;	)	
BEAZLEY-LLOYD'S SYNDICATES 2623/623;	)	
ALLIED WORLD NATIONAL ASSURANCE	)	
COMPANY; QBE SPECIALTY INSURANCE	)	
COMPANY; and GENERAL SECURITY	)	
INDEMNITY COMPANY OF ARIZONA,	)	
	)	
Defendants.	)	
	)	
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**PROPERTY INSURER DEFENDANTS' MOTION FOR SUMMARY JUDGMENT AND  
INCORPORATED MEMORANDUM OF LAW**

**EXHIBIT A-17**

*Plaintiff's Expert Disclosure and accompanying Expert Report of  
Mercedes Carnethon attached as Exhibit A  
(Deposition of Mercedes Carnethon, Exhibit 1)*

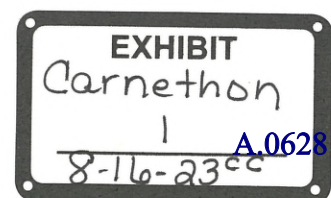
**IN THE UNITED STATES BANKRUPTCY COURT  
FOR THE DISTRICT OF DELAWARE**

In re	)	
	)	
RS FIT NW LLC,	)	Chapter 11
	)	
Debtor.	)	Case No.: 20-11558 (KBO)
	)	
<hr style="border: 0.5px solid black;"/>		
24 HOUR FITNESS WORLDWIDE, INC.,	)	(Jointly Administered)
	)	
Plaintiff,	)	
	)	
v.	)	
	)	
CONTINENTAL CASUALTY COMPANY;	)	
ENDURANCE AMERICAN SPECIALTY	)	
INSURANCE COMPANY; STARR SURPLUS	)	Adv. Proc. No. 20-51051 (KBO)
LINES INSURANCE COMPANY; ALLIANZ	)	
GLOBAL RISKS US INSURANCE	)	
COMPANY; LIBERTY MUTUAL	)	
INSURANCE COMPANY; BEAZLEY-	)	
LLOYD'S SYNDICATES 2623/623; ALLIED	)	
WORLD NATIONAL ASSURANCE	)	
COMPANY; QBE SPECIALTY INSURANCE	)	
COMPANY; and GENERAL SECURITY	)	
INDEMNITY COMPANY OF ARIZONA,	)	
	)	
Defendants.	)	
	)	
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**PLAINTIFF'S EXPERT DISCLOSURE PURSUANT  
TO FEDERAL RULE OF CIVIL PROCEDURE 26(a)(2)**

Pursuant to the Court's Amended Scheduling Order (Dkt. 196), Federal Rule of Civil Procedure 26, made applicable to the above-entitled adversary proceeding by Rule 7026 of the Federal Rules of Bankruptcy Procedure, Plaintiff 24 Hour Fitness Worldwide, Inc. ("Plaintiff"), by and through its attorneys of record, hereby discloses the following expert that Plaintiff may use in this action.

Plaintiff specifically reserves the right to supplement this Expert Disclosure in accordance with the Federal Rules of Civil Procedure and/or by the dictates of any Court order. Plaintiff also



specifically reserves the right to modify, amend, or withdraw any aspect of this Expert Disclosure. Plaintiff reserves the right to call rebuttal expert witnesses whose testimony cannot reasonably be foreseen until other Parties to this suit provide their expert reports and/or present their experts for deposition and/or present their evidence at trial. Plaintiff reserves the right to disclose any additional expert(s) pursuant to the expert discovery schedule established by the Court.

Subject to the limitations set forth above, Plaintiff identifies the following retained individuals who may serve as an expert witness on Plaintiff's behalf:

**Mercedes R. Carnethon, Ph.D.**  
**680 N. Lak Shore Drive, Suite 1400**  
**Chicago, IL 60611**

Plaintiff expects Ms. Carnethon to provide expert testimony regarding the facts, opinions, and conclusions expressed in her signed report, attached hereto as **Exhibit A**. Pursuant to Rule 26(a)(2)(B)(i)-(vi), information concerning Ms. Carnethon's qualifications (encompassed in her report and in her curriculum vitae), publications, prior testimony, compensation, and materials she relied on are also included in her report.

Plaintiff hereby incorporates by reference Ms. Carnethon's expert report and all subparts and attachments thereto. The individuals identified in this Expert Disclosure may be contacted only through Plaintiff's undersigned counsel.

Dated: October 21, 2022

**REED SMITH LLP**

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**COUNSEL FOR PLAINTIFF 24 HOUR  
FITNESS WORLDWIDE, INC.**



# EXHIBIT A

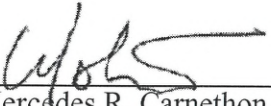
**24 HOUR FITNESS WORLDWIDE INC. v.  
CONTINENTAL CASUALTY COMPANY et al.**

**United States Bankruptcy Court  
District of Delaware  
Case No. 20-11568 (KBO)  
Adv. Pro. No. 20-51051 (KBO)**

**Expert Report**  
**Of**  
**Mercedes R. Carnethon, Ph.D.**

**October 21, 2022**

Prepared By

  
\_\_\_\_\_  
Mercedes R. Carnethon, Ph.D.

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**List of Exhibits**

Exhibit A: Curriculum Vitae for Mercedes R. Carnethon, Ph.D.

Exhibit B: List of Materials Considered

## I Introduction

I submit this Report in support of 24 Hour Fitness Worldwide Inc.'s ("24HF") adversarial proceeding in the United States Bankruptcy Court for the District of Delaware styled as *24 Hour Fitness Worldwide Inc. v. Continental Casualty Company et al.*, Case No. 20-11568 (KBO), Adv. Pro. No. 20-51051 (KBO).

## II Credentials and Professional Background

I am an epidemiologist, Professor and Vice Chair of the Department of Preventive Medicine, and Professor of Medicine in Pulmonary and Critical Care at the Northwestern University Feinberg School of Medicine. I have been a faculty member for 20 years after earning an A.B. in Human Biology with Honors from Stanford University, Master's and Doctoral Degrees in Epidemiology from the University of North Carolina at Chapel Hill, and postdoctoral training in cardiovascular disease epidemiology from the Stanford University School of Medicine. I have received funding for my research continuously by the National Institutes of Health as a Principal Investigator or Co-Investigator since 2003. Findings from my research have appeared in 315 original research articles, 20 commentaries and editorials, 15 scientific statements, and 3 published books.

My research typically focuses on the distribution and determinants of the leading causes of death in the United States and globally, including cardiovascular disease and lung disease. In October 2021, the National Heart, Lung, and Blood Institute Board of Scientific Counselors (NHLBI) appointed me to advise the Institute on research priorities and initiatives. I also serve as a Special Government Employee, a position awarded only to those with a substantial and sustained contribution to the field and required approval and appointment by a White House special committee. Additionally, the NHLBI solicits my expert opinion on a triannual basis to discuss the portfolio of research studies targeted for potential funding by the Institute.

Since the onset of the COVID-19 pandemic in 2020, I have contributed my expertise in research methodology and behavioral medicine to identifying populations at the greatest risk for severe COVID-19 infections. I have discussed the effectiveness and application of disease mitigation strategies with workplaces, schools, churches, and the like. I have also published scientific articles about antibody-determined prevalence of SARS-CoV-2 among healthcare workers,<sup>1</sup> viral load dynamics in mild to moderate infections,<sup>2</sup> behavioral responses to the pandemic,<sup>3</sup> and

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<sup>1</sup> Wilkins JT, Gray EL, Wallia A, Hirschhorn LR, Zembower TR, Ho J, Kalume N, Agbo O, Zhu A, Rasmussen-Torvik LJ, Khan SS, Carnethon M, Huffman M, Evans CT. Seroprevalence and Correlates of SARS-CoV-2 Antibodies in Health Care Workers in Chicago. *Open Forum Infect Dis*. Jan 2021;8(1); and Wilkins JT, Hirschhorn LR, Gray EL, Wallia A, Carnethon M, Zembower TR, Ho J, DeYoung BJ, Zhu A, Torvik LJR, Taiwo B, Evans CT. Serologic Status and SARS CoV-2 Infection over 6-Months of Follow-Up in Healthcare Workers in Chicago: A Cohort Study. *Infect Control Hosp Epidemiol*. Aug 9 2021;1-29.

<sup>2</sup> Caplan A, Bates KW, Brioni C, Santos A, Sabatini LM, Kaul KL, Carnethon MR, Khandekar JD, Greenland P. Clinical characteristics and viral load dynamics of COVID-19 in a mildly or moderately symptomatic outpatient sample. *PLoS One*. 2021;16(10).

<sup>3</sup> Lin AW, Granata FA, Trippel AK, Tello L, Stump TK, Wong M, Carnethon MR, Kershaw KN, Makelarski J, Weller D. Food Handling Concerns and Practices at Home during the COVID-19 Pandemic by Food Security Status. *J Food Prot*. Mar 1 2022;85(3):518-526.



vaccine intentions among healthcare workers.<sup>4</sup> Relatedly, I received financial support from the American Lung Association to determine the antibody prevalence of SARS-CoV-2 infection in a cohort of 4,000 young adults (ages 25-35).<sup>5</sup>

I have additionally contributed to public health messaging around the pandemic, appearing regularly on cable news (e.g., MSNBC), network television (e.g., ABC World News Tonight, PBS NewsHour, and Good Morning America) and radio (e.g., Bloomberg TV/radio and National Public Radio) in the United States and Canada (e.g., NewsNow) to interpret scientific concepts related to the COVID-19 pandemic. I also provided testimony on COVID-19 disparities among older adults to the U.S. Senate Special Committee on Aging on July 21, 2020,<sup>6</sup> and was an invited speaker to the National Disability Forum Conference for the Social Security Administration on November 18, 2020.<sup>7</sup> I have also been an invited speaker at numerous scientific conferences including the American Heart Association, Society for Behavioral Medicine, the National Institutes of Health, and the Society for Epidemiologic Research to discuss the impact of the COVID-19 pandemic on various population subgroups. I have not previously served as an expert witness in any court proceeding.

For further information concerning my qualifications and credentials, please consult my curriculum vitae, which is attached to this Report as **Exhibit A**. For my work in this case, I am being compensated at a rate of \$250 per hour. My compensation is not contingent on the outcome of this litigation.

### **III Assignment, Materials Considered, and Methodology**

As an epidemiologist, my studies focus on the distribution and causes of health events, including the prevalence of communicable diseases in particular populations. To that end, counsel for 24HF requested that I provide expert opinion testimony in this case to assist the trier of fact in, among other things: (1) evaluating and understanding the nature of SARS-CoV-2 (the virus that causes COVID-19) and COVID-19; (2) evaluating and understanding how SARS-CoV-2 and the COVID-19 disease are detected, spread, and transmitted; (3) evaluating 24HF's conclusion that, based on the prevalence of COVID-19 in the United States, and in the communities where 24HF operates, and the nature of 24HF's operations, COVID-19 was actually present and spreading at all of 24HF's locations in the winter and spring of 2020; and (4) considering whether it was reasonable and necessary for 24HF to close its club locations due to these circumstances.

<sup>4</sup> Evans CT, DeYoung BJ, Gray EL, Wallia A, Ho J, Carnethon M, Zembower TR, Hirschhorn LR, Wilkins JT. Coronavirus disease 2019 (COVID-19) vaccine intentions and uptake in a tertiary-care healthcare system: A longitudinal study. *Infect Control Hosp Epidemiol*. Dec 27 2021:1-7.

<sup>5</sup> Reyfman PA, Sugar E, Hazucha H, Hixon J, Reynolds C, Bose S, Dransfield MT, Han MK, Estepar RSJ, Rice MB, Washko GR, Carnethon M, Kalhan R, American Lung Association Airways Clinical Research N, American Lung Association Airway's Clinical Research N. Study protocol for a national cohort of adults focused on respiratory health: the American Lung Association Lung Health Cohort (ALA-LHC) Study. *BMJ Open*. Jul 5 2021;11(7):e053342.

<sup>6</sup> The COVID-19 Pandemic and Seniors: A Look at Racial Disparities: <https://www.aging.senate.gov/hearings/the-covid-19-pandemic-and-seniors-a-look-at-racial-health-disparities>. Accessed June 22, 2022. Testimony: Washington, DC.

<sup>7</sup> Social Security Administration. Nov 18, 2020 COVID-19 and SSA Programs: Long-Term Health Effects (National Disability Forum: Social Security Administration). [https://www.ssa.gov/ndf/ndf\\_outreach.htm?tl=4](https://www.ssa.gov/ndf/ndf_outreach.htm?tl=4).



To evaluate these questions, practitioners in the field, like myself, utilize an accepted taxonomy to draw conclusions about causality.<sup>8</sup> The causality methodology epidemiologists use considers: (1) strength of effect; (2) consistency of findings observed across unique settings; (3) specificity—no other likely explanation; (4) temporality—the cause happens before the effect in time; (5) biological gradient—greater exposure should lead to greater incidence; (6) plausibility—a biologically plausible mechanism of association; (7) coherence between epidemiological observation and laboratory evidence; (8) experiment; and, (9) analogy—similarities between the observed association and other prior associations. Not all criteria must exist to reach a causality conclusion. Instead, there is a greater likelihood of causality as the number of present criteria increases. In the present case, causality includes an analysis of how the COVID-19 pandemic, including the presence and spread of COVID-19 and the SARS-CoV-2 virus, affected 24HF and its operations, and its conclusions and decisions.

In reaching my opinions in this Report, I took guidance from the above commonly accepted causal criteria (in particular consistency, biological plausibility, coherence, and analogy) that are subject to refinement or revision based on new knowledge gained as the pandemic, and the scientific literature, continues to evolve. I also base the opinions set forth in this Report on my personal experience and work as an epidemiologist and scholar, published scientific literature, media reports, government documents, as well as my review of certain discovery materials that have been provided to me by counsel in this case. A complete list of the materials that I considered in completing this Report is attached as **Exhibit B**. Additionally, I do not intend anything in this Report to convey an opinion regarding the interpretation or application of the insurance policies at issue in this litigation.

Further, as the discovery in this case continues and additional information is developed, including information from experts that the Insurer Defendants might engage, I reserve the right to supplement or modify my opinions either by submitting a supplemental report or through testimony at deposition and/or at trial of this matter. I also reserve the right to respond to any opinions offered by any Insurer Defendant in this case.

#### IV Summary of Opinions

A summary of my opinions contained in this Report is as follows:

1. SARS-CoV-2 (the virus that causes COVID-19) was circulating in the United States as early as January 2020 causing COVID-19, including in the communities where 24HF operates its fitness clubs.
2. The number of COVID-19 cases in the United States actually detected through testing in the winter, spring, and summer of 2020 reflected only a small proportion of the total United States cases. This is because diagnosed cases included only severely symptomatic cases that presented for testing. Asymptomatic and minimally symptomatic cases went largely undetected and, therefore, not counted, even though the scientific community understood early on that such cases existed. Today, the scientific community generally accepts that the number of detected COVID-19 cases in the United States in the winter,

<sup>8</sup> Hill AB. The Environment and Disease: Association or Causation? *Proc R Soc Med.* May 1965;58:295-300.

spring, and summer of 2020 represented only a fraction of the total number of actual COVID-19 cases that existed during that time.

3. There was no capacity for community surveillance testing for the presence of SARS-CoV-2 in the United States in March and April 2020. Consequently, the scientific consensus during this time was that COVID-19 was universally present (and spreading) throughout the United States, and that limiting interactions among people was the best strategy to stop continued spread. Given the paucity of testing, and the similarity of symptoms between individuals with COVID-19 and others with less fatal communicable respiratory illnesses caused by viruses, such as influenza or the common cold, it was necessary to treat all individuals with such symptoms as having COVID-19. Since the pandemic began during the winter months of 2020, there were innumerable individuals with such symptoms.<sup>9</sup> Indeed, given the testing limitations and the fact that individuals who were not symptomatic could spread the virus, it was necessary to treat everyone as if they were infected. The eventual implementation of mask mandates and social distancing requirements reflect this. These beliefs and strategies were reasonable and necessary at the time based on the information known, and these decisions appear even more reasonable and necessary given the benefit of hindsight.
4. The only agreed upon public health tools available at the time for stopping the ongoing spread of SARS-CoV-2 were lockdowns and quarantines. Symptom screening as a criterion for safe interactions among individuals was ineffective because SARS-CoV-2 was spreading amongst apparently asymptomatic and pre-symptomatic individuals. Accordingly, addressing facilities with known exposures to individuals displaying symptoms by, for example, cleaning and re-opening, was not a satisfactory option to protect individual health and safety, given the number of individuals infected with SARS-CoV-2 who never displayed symptoms, and the limitations associated with cleaning as an option for dealing with the spread of a virus. This is especially the case in a complex setting such as a fitness club with innumerable surfaces exposed to potential contamination from virus.
5. The primary method of SARS-CoV-2 transmission is through respiratory droplets. Based on standard practices in infection control, public health experts reasonably believed early in the pandemic that surface transmission was a pathway to exposure. Consequently, health officials and other health professionals advised people to regularly clean surfaces, a recommendation that left many individuals wiping down all surfaces, including groceries and food deliveries. While surface transmission is a plausible mechanism for COVID-19 transmission, surface cleaning alone is inadequate to stop the continued spread of the virus at indoor locations because, among other things, individuals visiting such facilities would likely re-introduce the virus on an ongoing basis and spread it through the air, not just onto surfaces. Moreover, to adequately clean surfaces, one would have to know exactly which surfaces had been contaminated, which was not

<sup>9</sup> According to the CDC, “adults have an average of 2-3 colds per year” and “most people get colds in the winter and spring” and the symptoms of a cold including sore throat, runny nose, coughing, sneezing, headaches and body aches, which are symptoms similar to COVID-19. See Centers for Disease Control and Prevention. CDC Features: Common Colds: Protect Yourself and Others. Accessed October 16, 2022, 2022. <https://www.cdc.gov/features/rhinoviruses/index.html#:~:text=Each%20year%20in%20the%20United,any%20time%20of%20the%20year.>



feasible given the lack of testing and the fact that respiratory droplets could be dispersed over a wide area and latch onto surfaces that could not be readily identified and cleaned. In addition, the scientific community did not know to what extent available cleaning products could eliminate the virus.

6. Based on the prevalence of SARS-CoV-2 and COVID-19 in the United States, including in the communities where 24HF operates; given the nature of 24HF's operations and the information 24HF had regarding the spread of COVID-19 generally, and at its locations; and given the prevalence and presence of individuals with other respiratory illnesses with similar symptoms, and the inability to differentiate between them; 24HF's conclusion, as confirmed in deposition testimony in this case, that COVID-19 was actually present and spreading at each of its locations (i.e., among staff, patrons and other visitors) during the winter and early spring of 2020 was reasonable. Given all of this, I also agree it was reasonable and necessary for 24HF to close all of its locations for the health and safety of individuals visiting its clubs.

## V Statement of Opinions

### A. Severe Acute Respiratory Syndrome Coronavirus-19 (SARS-CoV-2)

Severe Acute Respiratory Syndrome Coronavirus-19 (SARS-CoV-2) is a member of a large family of viruses called coronaviruses that can infect animals and humans and cause upper respiratory tract illnesses. SARS-CoV-2 is the virus that leads to the COVID-19 illness. SARS-CoV-2 is a small enveloped virus that is approximately 1  $\mu\text{m}$  in diameter and most commonly spreads through respiratory droplets when an infected person breathes, talks, coughs, or sneezes. SARS-CoV-2 is most often transmitted to another host by breathing viral particles, which then start to replicate in an individual's respiratory tract. The virus can survive on surfaces for some amount of time and may cause infection if a person touches the virus and then transmits it into their system by touching their mouth, nose, or eyes. An individual infected with SARS-CoV-2 can develop a cough and influenza-like symptoms—and, in severe cases, pneumonia and acute respiratory distress syndrome (ARDS).<sup>10</sup> For some individuals, the virus can lead to a more significant inflammatory response risking harm to multiple organs including the lungs, heart, stomach, or brain.

The uncertain and variable course of illness across individuals remains a significant source of concern. Although there are known correlates of severe (i.e., hospitalization and death) illness from COVID-19 such as autoimmune disease, pre-existing cardiovascular disease, severe lung disease, diabetes, obesity, and cancers, there remain individuals who experience severe illness in the absence of these pre-existing conditions. Even with the introduction of vaccines in late

<sup>10</sup> Guan WJ, Ni ZY, Hu Y, Liang WH, Ou CQ, He JX, Liu L, Shan H, Lei CL, Hui DSC, Du B, Li LJ, Zeng G, Yuen KY, Chen RC, Tang CL, Wang T, Chen PY, Xiang J, Li SY, Wang JL, Liang ZJ, Peng YX, Wei L, Liu Y, Hu YH, Peng P, Wang JM, Liu JY, Chen Z, Li G, Zheng ZJ, Qiu SQ, Luo J, Ye CJ, Zhu SY, Zhong NS, China Medical Treatment Expert Group for C. Clinical Characteristics of Coronavirus Disease 2019 in China. *N Engl J Med.* Apr 30 2020;382(18):1708-1720.

2020 to essential workers and age-eligible adults during the spring of 2021, COVID-19 rose to become the third leading cause of death in the United States by the close of 2021.<sup>11</sup>

Symptoms of COVID-19 are also present in the common cold, influenza, adenoviruses, rhinoviruses, respiratory syncytial virus, and other coronaviruses. The primary characteristics distinguishing COVID-19 from other respiratory or bacterial illnesses are its high rates of hospitalization and case fatality.<sup>12</sup> In 2021, the Centers for Disease Control and Prevention (CDC) estimated that between 1999 and 2019 there were 1.8 deaths from influenza per 100,000 in the population, while the estimated death rate from COVID-19 in 2020 was 217.5 per 100,000.<sup>13</sup> Importantly, scientists largely agree that COVID-19 deaths remain undercounted because of the limited capacity to test for COVID-19 in early 2020 in most countries, including in the United States.

### **B. Introduction of SARS-CoV-2 to Humans**

The scientific community currently agrees that the introduction of SARS-CoV-2 to humans began with zoonotic (i.e., animal to human) transmission of the SARS-CoV-2 virus (the virus that leads to the illness of COVID-19) from an animal species in an open market in Wuhan, China to a human during the fall of 2019.<sup>14</sup> While the species that carried the virus to humans remains unclear, contemporary evidence points to a naturally occurring event and not a laboratory “leak” or deliberate human activity.

Throughout the fall and into the winter of 2019, a cluster of cases of severe respiratory illnesses began to appear in and around Wuhan, China. Spikes in hospitalizations and illnesses in the autumn of 2019 and early winter months of 2020 led the WHO to announce publicly a “mysterious coronavirus-related pneumonia” on January 9, 2020.

Following identification of the original cluster of cases tied to the open market in Wuhan, China, clusters of outbreaks began to spread throughout China. One such outbreak was tied to Lunar New Year celebrations that brought together young adult revelers from around the country.<sup>15</sup> These individuals then returned to their home provinces and countries, which likely caused the virus to spread beyond China. Global travel eventually led to spread throughout Europe and then other continents, including North America. In Europe, Italy was the first country to detect

<sup>11</sup> Ahmad FB, Cisewski JA, Anderson RN. Provisional Mortality Data - United States, 2021. *MMWR Morb Mortal Wkly Rep.* Apr 29 2022;71(17):597-600.

<sup>12</sup> Iacobucci G. Covid and flu: what do the numbers tell us about morbidity and deaths? *BMJ.* 2021;375:n2514; Jeganathan N, Grewal S, Sathananthan M. Comparison of Deaths from COVID-19 and Seasonal Influenza in the USA. *Lung.* Oct 2021;199(5):559-561.

<sup>13</sup> Centers for Disease Control and Prevention. Influenza Fast Stats. Accessed October 21, 2022: <https://www.cdc.gov/nchs/fastats/flu.htm>.

<sup>14</sup> Umakanthan S, Sahu P, Ranade AV, Bukelo MM, Rao JS, Abrahao-Machado LF, Dahal S, Kumar H, Kv D. Origin, transmission, diagnosis and management of coronavirus disease 2019 (COVID-19). *Postgrad Med J.* Dec 2020;96(1142):753-758.

<sup>15</sup> Chen S, Yang J, Yang W, Wang C, Barnighausen T. COVID-19 control in China during mass population movements at New Year. *Lancet.* Mar 7 2020;395(10226):764-766.



substantial numbers of COVID-19,<sup>16</sup> although by mid-February outbreaks had occurred in 28 European countries,<sup>17</sup> on cruise ships,<sup>18</sup> and in congregate settings such as nursing homes.

Evidence of the spread of SARS-CoV-2 within Asia and Europe led the CDC to begin screening incoming passengers arriving at select airports in the United States on January 20, 2020. For example, the CDC performed passenger screens at airports that had the highest volume of travelers from Wuhan Province to the United States. These airports included John F. Kennedy airport in New Jersey/New York (JFK), San Francisco International airport (SFO), and Los Angeles International airport (LAX). Also around January 20, 2020, the first confirmed case of COVID-19 in the United States was detected in Washington State in an individual who had recently traveled from the Wuhan Province in China.<sup>19</sup>

Also in or around January 2020, transmission patterns of infections suggested to scientists in China that the illness was circulating from person to person. Given the significant loss of life associated with COVID-19, China implemented strict and unprecedented lockdowns in Wuhan and neighboring provinces on January 23, 2020. On January 31, 2020, after confirming 9,800 known cases and 200 deaths worldwide, the WHO declared a Global Health Emergency. The WHO then upgraded the Global Health Emergency to a pandemic on March 11, 2020. A “pandemic” constitutes an outbreak of a disease that occurs over a wide geographic area (such as multiple countries or continents) and typically affects a significant proportion of the population.

Multiple clusters of cases in March 2020, not tied to travel, followed the initial travel-related cases in the United States. The case clusters began in states on both coasts—California, Washington, and New York. These case clusters were the first evidence of community spread in the United States. As defined by the CDC, community spread is the spread of an infectious disease where the source of the infection is unknown. Community spread indicates widespread transmission of the virus from person to person throughout the community at large. On February 26, 2020, the CDC posted an advisory about the first case of community spread in the United States in California.<sup>20</sup> Subsequent to the initial case, similar outbreaks began occurring

<sup>16</sup> Indolfi C, Spaccarotella C. The Outbreak of COVID-19 in Italy: Fighting the Pandemic. *JACC Case Rep.* Jul 15 2020;2(9):1414-1418.

<sup>17</sup> Spiteri G, Fielding J, Diercke M, Campese C, Enouf V, Gaymard A, Bella A, Sognamiglio P, Sierra Moros MJ, Riutort AN, Demina YV, Mahieu R, Broas M, Bengnér M, Buda S, Schilling J, Filleul L, Lepoutre A, Saura C, Mailles A, Levy-Bruhl D, Coignard B, Bernard-Stoecklin S, Behillil S, van der Werf S, Valette M, Lina B, Riccardo F, Nicastri E, Casas I, Larrauri A, Salom Castell M, Pozo F, Maksyutov RA, Martin C, Van Ranst M, Bossuyt N, Siira L, Sane J, Tegmark-Wisell K, Palmérus M, Broberg EK, Beauté J, Jorgensen P, Bundle N, Pereyaslov D, Adlhoeh C, Pukkila J, Pebody R, Olsen S, Ciancio BC. First cases of coronavirus disease 2019 (COVID-19) in the WHO European Region, 24 January to 21 February 2020. *Euro Surveill.* Mar 2020.

<sup>18</sup> Nakazawa E, Ino H, Akabayashi A. Chronology of COVID-19 Cases on the Diamond Princess Cruise Ship and Ethical Considerations: A Report From Japan. *Disaster Med Public Health Prep.* Aug 2020;14(4):506-513.

<sup>19</sup> Bajema KL, Wiegand RE, Cuffe K, Patel SV, Iachan R, Lim T, Lee A, Moyse D, Havers FP, Harding L, Fry AM, Hall AJ, Martin K, Biel M, Deng Y, Meyer WA, III, Mathur M, Kyle T, Gundlapalli AV, Thornburg NJ, Petersen LR, Edens C. Estimated SARS-CoV-2 Seroprevalence in the US as of September 2020. *JAMA Internal Medicine.* 2021;181(4):450-460; Holshue ML, DeBolt C, Lindquist S, Lofy KH, Wiesman J, Bruce H, Spitters C, Ericson K, Wilkerson S, Tural A, Diaz G, Cohn A, Fox L, Patel A, Gerber SI, Kim L, Tong S, Lu X, Lindstrom S, Pallansch MA, Weldon WC, Biggs HM, Uyeki TM, Pillai SK. First Case of 2019 Novel Coronavirus in the United States. *New England Journal of Medicine.* 2020;382(10):929-936.

<sup>20</sup> Centers for Disease Control and Prevention. CDC Confirms Possible Instance of Community Spread of COVID-19 in U.S. 2020. Accessed October 7, 2022. <https://www.cdc.gov/media/releases/2020/s0226-Covid-19->



elsewhere in the U.S. One of the first large outbreaks of COVID-19 in the United States took place in March at a choir practice in Washington State when 32 out of 122 attendees contracted COVID-19, and another 20 probable secondary COVID-19 cases occurred.<sup>21</sup> An outbreak at a skilled nursing home in Washington State was a harbinger of the devastating spread of the virus in congregate care settings.<sup>22</sup>

Each of these outbreaks shared at least one common theme: groups of people were together indoors for an extended length of time in the presence of the virus. The shared environments, inclusive of the indoor air and surfaces, were considered primary sources for transmission. Following the steps taken by countries in Asia and Europe, which launched heretofore unheard of quarantine policies to prohibit large groups from gathering and limited business operations to protect workers and patrons both, the United States began to take similar steps beginning in March 2020.<sup>23</sup>

### C. Mitigation Strategies for SARS-CoV-2

In the spring and summer of 2020, the capacity and ability for detecting SARS-CoV-2 were severely limited. As a result, the United States (as well as other countries) initiated mitigation strategies designed to curtail the ongoing spread by shutting down the primary mode of transmission: person-to-person contact. Decisions in the United States to cease non-essential business to control the ongoing spread of the disease were based on analogy from European and Asian countries that had already imposed their own lockdowns, consistent with best practices in public health. Government action to close non-essential business and impose mandatory quarantines were chosen because of historical actions taken to stop the spread of other infectious diseases, including the initial SARS outbreak in 2003, the Ebola outbreaks in West Africa in 2014, and even further back in history during plagues of cholera in the 14th century. These actions were based on the biological likelihood of person-to-person transmission in enclosed places and analogous pandemic responses throughout history.

However, even before many state and local governments in the United States acted, there were a series of public closures of business and recreational operations due to the presence and spread of the virus. For example, the National Basketball Association (NBA) abruptly canceled games on the evening of March 11, 2020 following notification of infected players.<sup>24</sup> The NBA

[spread.html#:~:text=Community%20spread%20means%20spread%20of,picked%20up%20by%20astute%20clinicians.](#)

<sup>21</sup> Hamner L, Dubbel P, Capron I, Ross A, Jordan A, Lee J, Lynn J, Ball A, Narwal S, Russell S, Patrick D, Leibrand H. High SARS-CoV-2 Attack Rate Following Exposure at a Choir Practice - Skagit County, Washington, March 2020. *MMWR Morb Mortal Wkly Rep.* May 15 2020;69(19):606-610.

<sup>22</sup> McMichael TM, Clark S, Pogojans S, Kay M, Lewis J, Baer A, Kawakami V, Lukoff MD, Ferro J, Brostrom-Smith C, Riedo FX, Russell D, Hiatt B, Montgomery P, Rao AK, Currie DW, Chow EJ, Tobolowsky F, Bardossy AC, Oakley LP, Jacobs JR, Schwartz NG, Stone N, Reddy SC, Jernigan JA, Honein MA, Clark TA, Duchin JS, Public Health S, King County E, Team CC-I. COVID-19 in a Long-Term Care Facility - King County, Washington, February 27-March 9, 2020. *MMWR Morb Mortal Wkly Rep.* Mar 27 2020;69(12):339-342.

<sup>23</sup> Levenson M. Scale of China's Wuhan Shutdown is Believed to be Without Precedent. *The New York Times.* <https://www.nytimes.com/2020/01/22/world/asia/coronavirus-quarantines-history.html>.

<sup>24</sup> Aschburner S. Coronavirus pandemic causes NBA to suspend season after player tests positive. *NBA.* March 12, 2020. Accessed August 8, 2022. <https://www.nba.com/news/coronavirus-pandemic-causes-nba-suspend-season>.

subsequently paused the season indefinitely the next day, and within a few days, the National Collegiate Athletic Association (NCAA) canceled both of its college basketball tournaments.<sup>25</sup>

Across the next two weeks and beyond, multiple U.S. states, counties and cities closed schools, and workplaces asked their employees to work remotely, all reflecting the concept that individuals needed to be treated as if they were infected with the virus and could spread it to others. The Boston University COVID Mitigation Policy Tracking Database compiled a listing of dates of closures of essential businesses across the country. See **Table 1** below.<sup>26</sup>

**Table 1: Listing of Business Closures by State and Date**

State	Start	End
Alabama	4/4/2020	4/30/2020
Alaska	3/28/2020	4/24/2020
Arizona	3/31/2020	5/16/2020
Arkansas		
California	3/19/2020	1/25/2021
Colorado	3/26/2020	4/27/2020
Connecticut		5/20/2020
Delaware	3/24/2020	6/1/2020
District of Columbia	4/1/2020	5/29/2020
Florida	4/3/2020	5/18/2020
Georgia	4/3/2020	5/1/2020
Hawaii	3/25/2020	5/31/2020
Idaho	3/25/2020	5/1/2020
Illinois	3/21/2020	5/29/2020
Indiana	3/25/2020	5/18/2020
Iowa		
Kansas	3/30/2020	5/4/2020
Kentucky		6/29/2020
Louisiana	3/23/2020	5/15/2020
Maine	4/2/2020	5/31/2020
Maryland	3/30/2020	5/15/2020
Massachusetts	3/24/2020	5/18/2020
Michigan	3/24/2020	6/1/2020
Minnesota	3/28/2020	5/18/2020
Mississippi	4/3/2020	4/27/2020

State	Start	End
Missouri	4/6/2020	5/4/2020
Montana	3/28/2020	4/26/2020
Nebraska		
Nevada	3/31/2020	5/9/2020
New Hampshire	3/28/2020	6/16/2020
New Jersey	3/21/2020	6/9/2020
New Mexico	3/24/2020	
New York	3/22/2020	6/27/2020
North Carolina	3/30/2020	5/22/2020
North Dakota		
Ohio	3/24/2020	5/20/2020
Oklahoma	0	5/15/2020
Oregon	3/23/2020	6/19/2020
Pennsylvania	4/1/2020	6/5/2020
Rhode Island	3/28/2020	5/9/2020
South Carolina	4/7/2020	5/4/2020
South Dakota		
Tennessee	4/2/2020	4/29/2020
Texas	0	5/1/2020
Utah		
Vermont	3/24/2020	5/15/2020
Virginia	3/30/2020	5/29/2020
Washington	3/23/2020	6/1/2020
West Virginia	3/24/2020	5/5/2020
Wisconsin	3/25/2020	5/13/2020
Wyoming		

<sup>25</sup> NCAA. NCAA cancels men's and women's basketball championships due to coronavirus concerns. Accessed August 8, 2022. <https://www.ncaa.com/live-updates/basketball-men/d1/ncaa-cancels-mens-and-womens-basketball-championships-due>.

<sup>26</sup> Additionally, a compendium of COVID-19 orders including those cited here may be accessed at via the Council of State Government Orders. See The Council of State Government Orders. 2020-2021 Executive Orders. Accessed October 21, 2022. <https://web.csg.org/covid19/executive-orders/>.



For example, on March 19, 2020, California implemented laws to shut down all non-essential activities and imposed a quarantine. The Governor's Order noted, "in a short period of time, COVID-19 has rapidly spread throughout California, necessitating updated and more stringent guidance from federal, state, and local public health officials." Other states soon followed suit. The Order issued by the Governor of the State of Washington on March 23, 2020 addressed "the continued worldwide spread of COVID-19, its significant progression in Washington State, and the high risk it poses to our most vulnerable populations." The Order recognized the notion that everyone had to be treated as if they had COVID-19 by "prohibiting all people in Washington State from leaving their homes or participating in . . . gatherings of any kind regardless of the number of participants" and "preventing all non-essential businesses" from conducting business. Such statewide orders also reflected the fact that indoor settings where people congregated, such as gyms, were particularly dangerous for the spread of COVID-19. Additionally, the Texas Governor's Order on March 31, 2020 ordered individuals in Texas to "avoid eating or drinking at bars, restaurants and food courts, or visiting gyms, massage establishments, tattoo studios, piercing studios, or cosmetology salons."

Of note, this data captures state-level closures, and does not factor in variability in closing dates by counties and cities, which, in many cases, had authority to work independently from states to account for the local context. For example, within San Francisco and Alameda counties in Northern California, stay-at-home orders were in place as early as March 16, which affected all businesses operating in those areas.<sup>27</sup>

The order issued by Alameda County discussed the ongoing spread of COVID-19 throughout the Bay Area of California, and the fact that asymptomatic individuals can transmit the disease:<sup>28</sup>

6. This Order is issued based on evidence of increasing occurrence of COVID-19 within the County and throughout the Bay Area, scientific evidence and best practices regarding the most effective approaches to slow the transmission of communicable diseases generally and COVID-19 specifically, and evidence that the age, condition, and health of a significant portion of the population of the County places it at risk for serious health complications, including death, from COVID-19. Due to the outbreak of the COVID-19 virus in the general public, which is now a pandemic according to the World Health Organization, there is a public health emergency throughout the County. Making the problem worse, some individuals who contract the COVID-19 virus have no symptoms or have mild symptoms, which means they may not be aware they carry the virus. Because even people without symptoms can transmit the disease, and because evidence shows the disease is easily spread, gatherings can result in preventable transmission of the virus. The scientific evidence shows that at this stage of the emergency, it is essential to slow virus transmission as much as possible to protect the most vulnerable and to prevent the health care system from being overwhelmed. One proven way to slow the transmission is to limit interactions among people to the greatest extent practicable. By

<sup>27</sup> Additionally, the database information is based on media reports and publicly available records and represents a best estimate. However, the patterns consistently indicate that most states enacted closures in March or April of 2020.

<sup>28</sup> Alameda County Health Officer. Order of the County Health Officer to Shelter in Place. March 16, 2020. <https://www.acgov.org/documents/Final-Order-to-Shelter-In-Place.pdf>.



Early guidance from the CDC and other health agencies also reflected the concept that all individuals presenting with illness symptoms needed to be treated as having COVID-19. For example, on March 24, 2020, the United States Surgeon General warned that, “everyone needs to act as if they have the virus right now. So, test or no test, we need you to understand you could be spreading it to someone else. Or you could be getting it from someone else. Stay at home.”<sup>29</sup> Moreover, California’s Department of Industrial Relations issued guidelines that any person presenting with “respiratory illness symptoms” should be treated and isolated as if they were infected with the virus.<sup>30</sup> The CDC issued similar guidance for all workplaces in the United States, urging employers to send employees presenting with “respiratory illness symptoms” home.<sup>31</sup>

These actions by sports leagues, state and local governments, health agencies, and businesses, within a relatively short period of time from the initial identification of SARS-CoV-2 in the United States, reflect the collective goal at the time to “flatten the curve” to curtail the ongoing and pervasive spread of the virus. This was particularly the case at indoor settings where people gather to protect the health and safety of individuals. Flattening the curve was also important to prevent overwhelming hospital systems by continued spread of the virus. Extremely high case fatality rates underscored these decisions to close businesses due to the presence and spread of the virus throughout communities, even though the social and economic implications of such closures were severe.

Mirroring the variability in timing of business closures, there was great variability in the businesses that were permitted to be open. Similarly, there was also variability under what conditions (e.g., limited capacity) and when a business could re-open across and within the United States. Variability in these rollbacks of public health mitigation strategies was guided in part by health metrics related to disease transmission in a given area and by public sentiment in the region.<sup>32</sup>

By mid-year of 2020 and into 2021, some jurisdictions deemed reopening possible because of the expanded capacity to identify those infected with the SARS-CoV-2 virus. Consequently, the impact of the public health policies in reducing continued transmission and the economic impact of the policies varied. Even in locations where businesses could reopen, the economic impacts of the pandemic continued in that many individuals concerned about contracting and spreading the virus were reluctant to resume their pre-pandemic activities. In addition, many businesses—even after being allowed to reopen—were required to adopt certain mitigation measures such as reduced capacity to allow for social distancing, installing protective barriers, etc., and some businesses adopted more restrictive measures on their own over-concerns about spreading the

<sup>29</sup> Shabad, R. Surgeon general has coronavirus warning: ‘This week, it’s going to get bad’. *NBC News*. Accessed October 21, 2022. <https://www.nbcnews.com/politics/white-house/surgeon-general-has-coronavirus-warning-week-it-s-going-get-n1166421>.

<sup>30</sup> Cal/OSHA. Cal/OSHA Interim Guidelines for General Industry on 2019 Novel Coronavirus Disease (COVID-19). March 4, 2020. <https://caltransit.org/cta/assets/File/CalOSHA%20Guidelines%20for%20General%20Industry%20on%20Coronavirus.pdf>.

<sup>31</sup> Centers for Disease Control and Prevention. Interim guidance for businesses and employers to plan and respond to 2019 coronavirus disease 2019 (COVID-19), February 2020. Accessed on October 21, 2022. <https://stacks.cdc.gov/view/cdc/85488>.

<sup>32</sup> Kiviniemi MT, Orom H, Hay JL, Waters EA. Prevention is political: political party affiliation predicts perceived risk and prevention behaviors for COVID-19. *BMC Public Health*. 2022/02/14 2022;22(1):298.

virus to employees and customers, including decisions to delay reopening altogether due to these concerns. In some locations, businesses permitted to reopen had to shut down again due to spikes in the spread of the virus before they could reopen permanently. This occurred in California with respect to fitness clubs.

#### D. SARS-CoV-2 Detection

The first step in epidemiologic surveillance is measuring the proportion of the population with the disease (i.e., prevalence) and the number of new cases that are detected within a given time period in the population at risk (i.e., the incidence). Barriers to identifying those infected with any “new” illness are common. Alternative and acceptable strategies are in place to estimate the presence of the disease that rely on clinical presentations of illness that align with observations among confirmed cases (i.e., symptomatology).

Initial community spread of SARS-CoV-2, and the resulting COVID-19 illness, went unrecognized or, at least, heavily undercounted in the United States and other countries. There are at least two primary reasons: (1) the arrival of the virus at a time when other respiratory viruses, such as the flu and common cold, were widely circulating, which obscured the initial spike; and (2) a severely limited capacity for testing and diagnosis.

In the Northern Hemisphere, the arrival of the cooler winter months triggers a high rate of circulating communicable respiratory illnesses, with rates peaking in the United States between December and February.<sup>33</sup> The year 2020 was no exception, with anecdotal reports in the media that December through January appeared to be a particularly severe flu season. Distinguishing between COVID-19, or any new virus, and existing communicable respiratory illnesses is challenging, and these challenges made it necessary at the time to treat any individual with a respiratory illness as having COVID-19. This posed considerable challenges for facilities with many individuals routinely coming in and out, like the 24HF locations. For example, as the CDC estimates, the average individual gets 2-3 colds per year and COVID-19 was circulating during the heart of cold and flu season.<sup>34</sup> It is without reasonable dispute that individuals with the common cold and related symptoms would have been present in each of the 24HF locations during this period, as well as individuals with the flu.

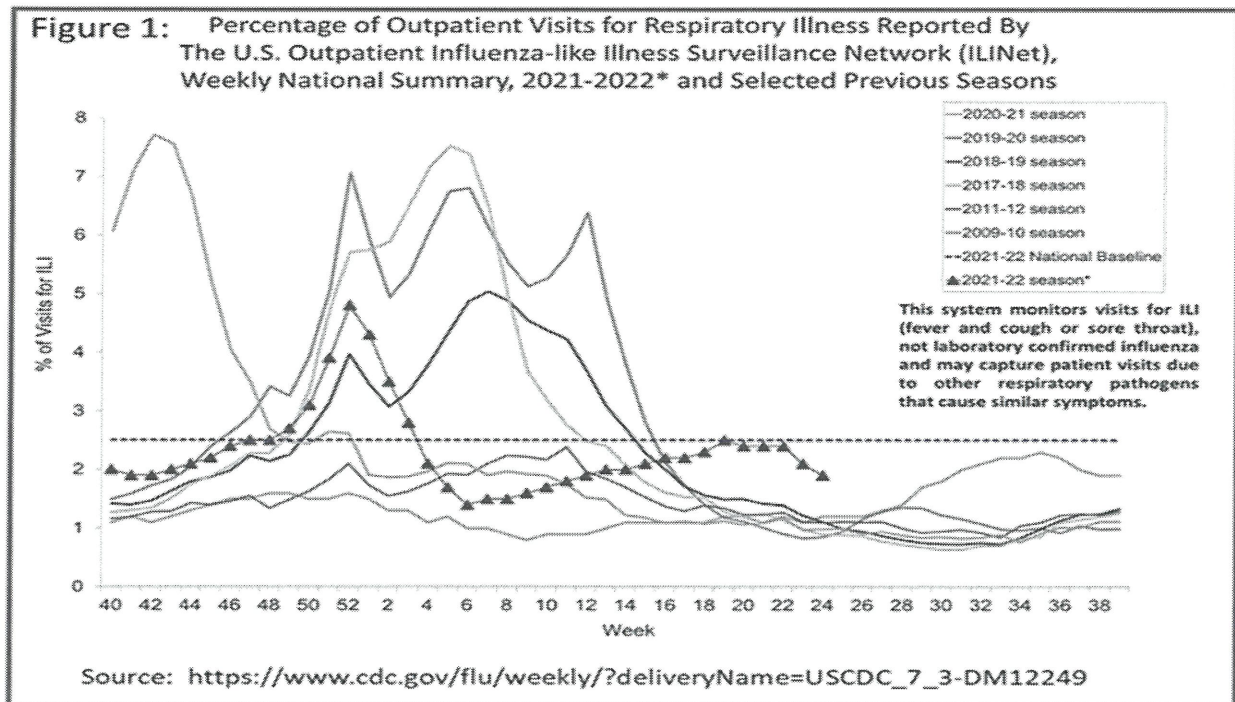
One signal indicating the introduction of a new disease is when hospitalization and death from similarly presenting illness vary either up (suggesting capture of more than just those with detectable illness) or down (suggesting that the new illness is infecting some proportion of people who would usually present with those illnesses) from what would be expected. **Figure 1** presents surveillance estimates collected by the U.S. Centers for Disease Control and Prevention for flu seasons (October through May) ranging from 2009-10 through 2020-21. Notable features of the chart are that as compared with the 2018-19 flu season (dark blue), the 2019-20 season (green) reports a higher rate of outpatient visits for influenza-like illnesses in nearly every month of the year. As noted on the chart, the system is capturing symptoms—notably fever, cough and sore

<sup>33</sup> Centers for Diseases Control and Prevention. Flu Season. Accessed June 30, 2022. <https://www.cdc.gov/flu/about/season/flu-season.htm#:~:text=The%20exact%20timing%20and%20duration,last%20as%20late%20as%20May.>

<sup>34</sup> Centers for Disease Control and Prevention. CDC Features: Common Colds: Protect Yourself and Others. Accessed October 16, 2022. <https://www.cdc.gov/features/rhinoviruses/index.html#:~:text=Each%20year%20in%20the%20United,any%20time%20of%20the%20year.>



throat—shared across many respiratory illnesses. Higher rates of illness in 2019-20 reflect the introduction of a new pathogen, namely SARS-CoV-2.



Notably, the level of illness in the 2020-21 season (depicted in magenta) was significantly lower—and the lowest during the surveillance period captured. Population mitigation measures adopted in response to the COVID-19 pandemic, which included making workers with respiratory illness symptoms stay home, closing non-essential businesses and reducing congestion in group-settings, succeeded in reducing transmission of all respiratory illnesses, despite the presence of the COVID-19 pandemic. These measures were reasonable and necessary given the lack of testing available and the resultant difficulties in distinguishing between individuals with COVID-19 and individuals with the flu or other less-harmful illnesses.

Missed diagnoses (i.e., undercounts) and misdiagnosis (i.e., incorrect attribution of disease) of COVID-19 with other respiratory illnesses during late 2019 and early 2020 were compounded by challenges in developing and distributing an assay for detecting the SARS-CoV-2 virus. The U.S. Centers for Disease Control and Prevention initially sent test kits to state health departments, but after collecting the samples, they required processing of the assays at CDC laboratories. These procedures led to substantial delays identifying cases of COVID-19. Further, given the limited availability of testing kits, only hospitalized patients or patients with a known direct contact with someone who was positive could obtain testing.

The intent behind these rules was to allocate scarce resources (i.e., diagnostic capacity) to the most vulnerable persons (e.g., sick individuals in the hospital) or those with a high pre-test probability of being positive for SARS-CoV-2 (i.e., people with a known exposure). However, these policies precluded the use of test kits to detect the virus in community settings, which meant that anyone showing symptoms of even mild illness were considered as infected with SARS-CoV-2. In other words, individuals presenting with flu-like or cold symptoms, for

example, had to be considered as having COVID-19 given the inability to conduct widespread testing. An individual with symptoms of cold, influenza, or other respiratory illnesses coming into a 24 Hour Fitness club, for example, had to be treated with the same level of concern as someone with COVID-19 would be treated, as the ability to distinguish between different communicable illnesses was extremely difficult, if at all possible, early in the pandemic. The prevalence of communicable respiratory illnesses in winter 2019 and spring 2020, which coincided with cold and flu season in the Northern Hemisphere—meant that individuals of concern were regularly in and out of 24HF clubs on a daily basis.

While it was necessary to presume that symptomatic individuals had COVID-19 and treat them accordingly, it was even more challenging to deal with the phenomenon of individuals who did not have any symptoms, but who were still spreading disease. Asymptomatic and pre-symptomatic spread posed risks to the community at large and, without surveillance testing of a random sample of the population (not just those who have symptoms), the safest possible action by governments, businesses, and schools was to restrict interactions among all individuals to slow down the ongoing spread of disease. In other words, the safest and necessary course of action was to act as though everyone was infected and spreading the virus.

Nevertheless, laboratories at academic institutions did develop tests to identify antibodies to the virus, which they deployed to estimate the number of cases in a given region (**Figure 2**).<sup>35</sup> These tests are what allowed for the early estimates of how widely SARS-CoV-2 was circulating in U.S. communities.

#### **E. Prevalence of SARS-CoV-2 in the United States in 2020**

The current understanding of the COVID-19 timeline in the United States is informed by a series of retrospective studies relying on trend data for respiratory infection (reflected by **Figure 1**) and utilizing bio-specimens initially collected for other purposes.

Retrospective investigations in archived blood and urine samples indicate that SARS-CoV-2 was present and circulating widely in major metropolitan areas in the United States in the winter months of 2020.<sup>36</sup> In one such study, the prevalence of SARS-CoV-2 was 5% between March 12-13 and 15-16 in Los Angeles County. The authors commented that the prevalence was “concerning” given that the average age of patients was 38 years old and that all patients had mild illness and thus were circulating in the community and at risk of transmitting the illness to others in the population.<sup>37</sup> This further illustrates the points made above regarding difficulties dealing with any individuals displaying respiratory illness symptoms.

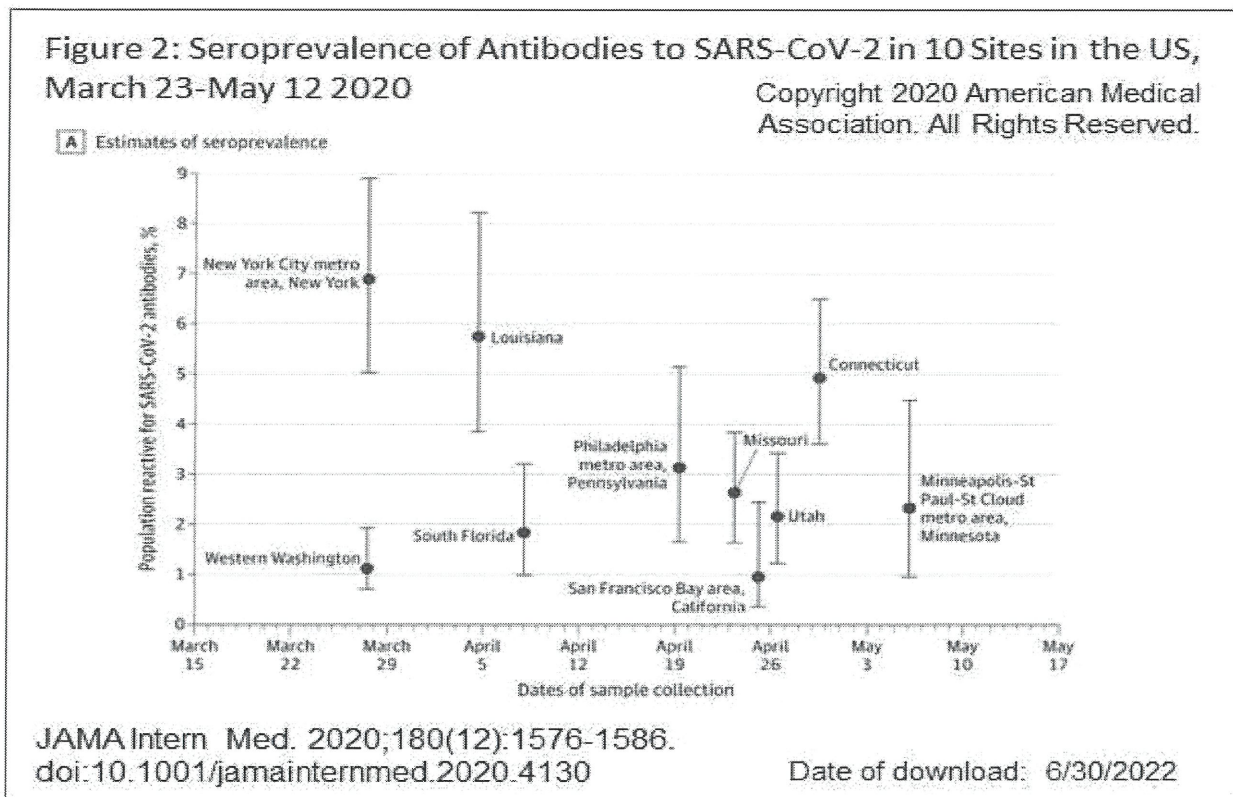
<sup>35</sup> Havers FP, Reed C, Lim T, Montgomery JM, Klena JD, Hall AJ, Fry AM, Cannon DL, Chiang C-F, Gibbons A, Krapivnaya I, Morales-Betoulle M, Roguski K, Rasheed MAU, Freeman B, Lester S, Mills L, Carroll DS, Owen SM, Johnson JA, Semenova V, Blackmore C, Blog D, Chai SJ, Dunn A, Hand J, Jain S, Lindquist S, Lynfield R, Pritchard S, Sokol T, Sosa L, Turabelidze G, Watkins SM, Wiesman J, Williams RW, Yendell S, Schiffer J, Thornburg NJ. Seroprevalence of Antibodies to SARS-CoV-2 in 10 Sites in the United States, March 23-May 12, 2020. *JAMA Internal Medicine*. 2020;180(12):1576-1586.

<sup>36</sup> Spellberg B, Haddix M, Lee R, Butler-Wu S, Holtom P, Yee H, Gounder P. Community Prevalence of SARS-CoV-2 Among Patients With Influenza-like Illnesses Presenting to a Los Angeles Medical Center in March 2020. *JAMA*. 2020;323(19):1966-1967.

<sup>37</sup> *Id.*



Another commonly used strategy to detect illness deployed rapidly during the pandemic was to test blood samples (i.e., serum) for the presence of antibodies to the virus. These so-called seroprevalence studies were able retroactively to identify infection in the community. **Figure 2** displays findings from a seroprevalence study conducted across a broader time interval (March 23 to May 12) and in multiple cities in the United States.



There was wide variability in the detection of antibodies to the SARS-CoV-2 infection, from a high of 6.9% in New York City to 1% in the San Francisco Bay Area.<sup>38</sup> These observations have caused scientists and clinicians to conclude that some hospitalizations and deaths predating the identification of the first positive SARS-CoV-2 test in January of 2020 in the United States that were presumed to be influenza may have been co-infections with SARS-CoV-2 or misdiagnosed altogether as influenza.

While hospitalization and death are the most severe outcomes, and so the easiest to quantify, they reflect the “tip of the iceberg,” and undercount infected individuals who are minimally symptomatic, presumed to have the “common cold” but really have COVID-19, and even asymptomatic. In a seminal report from the COVID-19 surveillance office, the authors concluded that “sustained, community transmission had begun before detection of the first two

<sup>38</sup> Havers FP, Reed C, Lim T, Montgomery JM, Klena JD, Hall AJ, Fry AM, Cannon DL, Chiang C-F, Gibbons A, Krapinaya I, Morales-Betoulle M, Roguski K, Rasheed MAU, Freeman B, Lester S, Mills L, Carroll DS, Owen SM, Johnson JA, Semenova V, Blackmore C, Blog D, Chai SJ, Dunn A, Hand J, Jain S, Lindquist S, Lynfield R, Pritchard S, Sokol T, Sosa L, Turabelidze G, Watkins SM, Wiesman J, Williams RW, Yendell S, Schiffer J, Thornburg NJ. Seroprevalence of Antibodies to SARS-CoV-2 in 10 Sites in the United States, March 23-May 12, 2020. *JAMA Internal Medicine*. 2020;180(12):1576-1586.



non-travel related U.S. cases, likely resulting from the importation of a single lineage of virus from China in late January or early February, followed by several importations from Europe.”<sup>39</sup>

#### F. 24HF’s Operations and Insurance Claim

24HF operates health and fitness clubs with facilities spanning the United States, with a particularly high density in major metropolitan areas. **Figure 3** depicts the various locations where 24HF operates one or more locations.



24HF’s clubs are predominantly located in urban and suburban high-density settings, which are areas that 24HF understood experienced high rates of illness from COVID-19 and other respiratory infections.<sup>40</sup> For example, 24HF believed that COVID-19 was present at all its insured locations based on available COVID-19 tracking data such as that provided by John Hopkins University.<sup>41</sup>

Based on information provided to me by the company, as well as conversations with 24HF representatives, I also understand that 24HF’s clubs were highly trafficked in early 2020. For example, **Table 2** summarizes the average number of guests, workouts, and personal training sessions at 284 24HF locations between January 1 and March 13, 2020. The term “Guest” in **Table 2** refers to individuals who are *not* 24HF members, but visited a 24HF location to workout in some capacity, such as on a trial basis. The term “Member Workouts” in **Table 2** refers to workouts performed by 24HF members. “PT” as used in **Table 2** refers to personal training

<sup>39</sup> Team CC-R, Jorden MA, Rudman SL, Villarino E, Hoferka S, Patel MT, Bemis K, Simmons CR, Jespersen M, Iberg Johnson J, Mytty E, Arends KD, Henderson JJ, Mathes RW, Weng CX, Duchin J, Lenahan J, Close N, Bedford T, Boeckh M, Chu HY, Englund JA, Famulare M, Nickerson DA, Rieder MJ, Shendure J, Starita LM. Evidence for Limited Early Spread of COVID-19 Within the United States, January-February 2020. *MMWR Morb Mortal Wkly Rep.* Jun 5 2020;69(22):680-684.

<sup>40</sup> Gottlieb Deposition, pp. 14:22-15:17; Larson Deposition, p. 54:2-19.

<sup>41</sup> See Plaintiff’s Response to Defendant Continental Casualty Company’s First Set of Interrogatories, Interrogatory No. 3.



sessions. Finally, as reported to me by 24HF personnel, members spend on average approximately 40 minutes per workout session at 24HF.

**Table 2: Average Daily Guest Census from 24 Hour Fitness Clubs between January 1, 2020 and March 13, 2020 (73 Days; 284 Clubs)**

<b>284 Applicable Open Clubs from Current Portfolio</b>					
Total Guests	350,089	Total Member Workouts	28,901,941	Total PT Sessions Serviced	258,490
Guest per Day	4,796	Member Workout per Day	395,917	~ PT Session Serviced per Day	3,541
Average Guest per Club per Day	16.9	Average Member Workout per Club per Day	1,394.1	Average PT Session Serviced per Club per Day	12.5

In early 2020, COVID-19 began to affect 24HF's operations and the company made a claim for insurance. For example, I understand that on April 16, 2020, 24HF provided Insurers with information regarding the impact of COVID-19 at its locations in response to Insurers' requests for information. 24HF informed Insurers that it should be "presumed that individuals infected with COVID-19 were present at all of [its] locations" based on the nature of the disease and its presence within the communities in which 24HF operates, and the hazards associated with large groups of people gathering in locations such as its clubs.<sup>42</sup>

In addition, 24HF reported that it had learned of several instances in which team members and/or 24HF patrons with actual or suspected cases of COVID-19 entered its facilities.<sup>43</sup> On May 12, 2020, 24HF further notified the Insurers of twenty-four (24) specific incidents regarding COVID-19 at its locations.<sup>44</sup> These twenty-four (24) incidents detailed situations in which a person who visited a 24HF location tested positive for COVID-19, experienced symptoms of COVID-19, was exposed to COVID-19, was required to quarantine after diagnosis or exposure, and/or was being tested for COVID-19.<sup>45</sup> For example, when reporting these encounters to the insurers, 24HF provided a date on which it learned of the member in a specific location testing positive for COVID;<sup>46</sup> disclosed that a member was required to quarantine due to COVID-19;

<sup>42</sup> ARGUS000446-455; Plaintiff's Response to Defendant Continental Casualty Company's First Set of Interrogatories, Interrogatory No. 3 ("[T]here should be no dispute that COVID-19 and SARS-CoV-2 were present at each of Plaintiff's covered locations at various points in time during the policy period, including the period of time prior to and including March 16, 2020 when all of Plaintiff's clubs were first closed. Furthermore, there should be no dispute that COVID-19 and SARS-CoV-2 were also present at Plaintiff's locations during those interim time periods when Plaintiff's clubs were allowed to reopen and then were subsequently closed again by civil order.").

<sup>43</sup> Ueber Deposition, pp. 71:20-72:4; ARGUS000365-383; ARGUS000446-455; ARGUS000467-479; and ARGUS000521-535; Plaintiff's Response to Insurers' First Set of Interrogatories, Interrogatory No. 7.

<sup>44</sup> ARGUS000467-479.

<sup>45</sup> *Id.*

<sup>46</sup> *Id.*



and/or that a member experienced symptoms of COVID-19 after a person in that individual's household tested positive.<sup>47</sup> Some of the examples even specified that the member had been present at the 24HF just prior to a positive diagnosis.<sup>48</sup>

This is the type of information I would expect a business like 24HF to receive with regard to COVID-19 during the period in question because individuals who visited a 24HF location with COVID-19 are under no obligation to report their diagnosis to the company. Moreover, given the lack of available testing, as detailed above, and the overall reluctance of individuals to report illnesses in general, I would not expect a business to have received detailed information regarding positive test results, dates of exposure to the virus or other more detailed information. In most cases, individuals with COVID symptoms, particularly non-employees who had visited a club, would not have reported anything to the company. For this reason, in my opinion, the information received by 24HF was just the "tip of the iceberg" in terms of incidents at its locations.

From my review of case materials produced in this litigation and discussions with 24HF personnel, 24HF understood COVID-19 to be a highly dangerous and readily transmissible virus.<sup>49</sup> A confluence of factors, including the rapidly evolving nature of the pandemic, numerous reports of the presence of COVID-19 on its premises, and governmental orders<sup>50</sup> necessitating closure, ultimately led 24HF to close all its clubs at 11:59 p.m. on March 16, 2020.<sup>51</sup>

Following the closure of its operations, 24HF began formally tracking COVID-19 related incidents at its clubs, including exposure rates and positive cases, as well as related governmental orders.<sup>52</sup> 24HF implemented a COVID-19 tracking log to monitor the actual or suspected presence of the virus.<sup>53</sup> 24HF further established a Crisis Communications Team to assess the evolution of COVID-19 at its facilities and to ensure the safe operation of its business.<sup>54</sup> In accordance with this, 24HF sent numerous COVID-19 notifications to team members and patrons advising these individuals that certain persons present at a 24HF facility had tested positive for, been diagnosed with, or was otherwise sent home due to COVID-19.<sup>55</sup>

24HF began reopening its facilities in waves.<sup>56</sup> During the process of reopening, it adopted policies and procedures to minimize the presence and transmission of the virus at its locations, as well as to mitigate the significant health risks posed to both team members and patrons. This included initiating a reopening playbook, which set forth processes governing scheduled reopenings, reservation systems, deep cleanings, touchless check-in systems, social distancing

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<sup>47</sup> *Id.*

<sup>48</sup> *Id.*

<sup>49</sup> See Plaintiff's Response to Defendant Continental Casualty Company's First Set of Interrogatories, Interrogatory No. 3.

<sup>50</sup> 24HF\_Production\_0000044-0001962.

<sup>51</sup> Larson Deposition, pp. 29:21-30:12, 77:20-78:14, 112:8-113:16; Gottlieb Deposition, pp. 13:3-14:21; Ueber Deposition, pp. 75:8-76:19; and ARGUS000446-455.

<sup>52</sup> Larson Deposition, pp. 65:11-25, 93:2-24, 101:20-102:2; Gottlieb Deposition, pp. 22:12-23:20; and Piro Deposition, pp. 76:16-78:10.

<sup>53</sup> *Id.*; Larson Deposition, pp. 67:12-68:10.

<sup>54</sup> Gottlieb Deposition, pp. 75:24-76:17.

<sup>55</sup> 24HF\_Production\_0002175-0002589.

<sup>56</sup> 24HF\_Production\_0003406.

measures, spacing of equipment, taking equipment out of service, and signage.<sup>57</sup> Nevertheless, the ever-changing nature of the pandemic forced 24HF to continuously open and close several of its locations throughout the country.<sup>58</sup>

It is my understanding that 24HF sought coverage under its insurance policies for losses suffered due to the pandemic. I also understand from 24HF's counsel that the Insurers contend that, in order to establish the actual presence and spread of COVID-19 at a 24HF location, 24HF must provide, for example: (1) evidence that a person tested positive for COVID-19; (2) evidence of when the person tested positive for COVID-19; (3) evidence that the person who tested positive visited a 24HF location at the time they were positive; (4) information as to where the person who tested positive went before and after testing positive; (5) information as to whether the person who tested positive wore a mask while at the 24HF location; and/or (6) evidence that a surface or piece of equipment tested positive for the presence of COVID-19 or evidence of COVID-19 in the air of a 24HF facility. I further understand from 24HF's counsel that Insurers contend that the Interruption by Communicable Disease Endorsement in policies at issue does not apply to claims stemming from the impact of COVID-19 because, among other things, the policy is "directed to a communicable disease that can actually be tested [for] the actual presence and spread" of the disease.<sup>59</sup>

Given the present understanding of the transmissibility of the virus and the lack of testing available in March 2020 to detect the presence and spread of COVID-19 on both persons and property, from an epidemiological perspective these positions are unreasonable, particularly when considering the nature of 24HF's business operations and the population of asymptomatic persons.

## VI Summary Conclusions

Based on my review of discovery, deposition testimony, conversations with 24HF personnel, as well as other information I have been provided, which is cited herein and listed in **Exhibit B**, I understand that 24HF's decision to close all of its clubs effective March 16, 2020 was based on its belief that COVID-19 was actually present and spreading at all its locations due to the prevalence of COVID-19 within the communities where it operated, and that there was no known method at the time to make its operations safe for its employees and members. In my professional opinion, 24HF's conclusion and beliefs were reasonable and appropriate, and its decision to close its clubs was a necessary reaction to the threat posed by COVID-19.

The basis for these conclusions relies on the criteria for causality cited in **Section III**. Because gathering experimental evidence by manipulating an exposure (e.g., introducing a disease vector such as a virus) and measuring the outcome prospectively (e.g., counting how many became

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<sup>57</sup> 24HF\_Production\_0000001; Larson Deposition, pp. 83:6-85:18; Plaintiff's Response to Defendant Continental Casualty Company's First Set of Interrogatories, Interrogatory No. 7 ("Plaintiff enacted enhanced cleaning procedures for its facilities and fitness equipment, as well as instituted social distancing procedures. Plaintiff also instituted stream-lined and contactless check-in procedures for its customers, and, as applicable, installed Plexiglas barriers to protect its staff and customers when they must interact. Plaintiff memorialized many of these new procedures and protocols in its updated policies and guidelines, which Plaintiff intends to produce.").

<sup>58</sup> 24HF\_Production\_0003406; Plaintiff's Response to Defendant Continental Casualty Company's First Set of Interrogatories, Interrogatory No. 19 ("[C]overed locations were first closed on March 16, 2020 and were reopened on a case-by-case basis, and in some cases were closed and then reopened again.").

<sup>59</sup> Starr 30(b)(6) Deposition, p. 83:2-23.



sick), is oftentimes unethical and largely infeasible in the presence of a public health emergency, scientists rely on causal criteria to make decisions about disease associations. My conclusions in this case that the actions taken by 24HF to close their clubs were justified as a strategy to stop the ongoing spread and prevent further transmission of COVID-19 in their clubs are based on the following agreed upon causal criteria in the field of epidemiology: consistency, analogy, biological plausibility and coherence. Not all criteria must be met in order to determine the likelihood of an association; however, when multiple criteria are present, the argument for causality is strengthened.

1. Consistency. Public health officials noted multiple cases of COVID-19 in densely populated spaces (e.g., outdoor markets in Asia, social gatherings, worksites). These observations that disease was spreading in densely populated spaces were observed consistently across geographic locations internationally and domestically. Consequently, the decision by 24HF to acknowledge the risks posed by continuing to operate densely populated clubs and shut down was reasonable based on the causal criteria of consistency.
2. Analogy. Business shutdowns in the U.S. were based both on consistency and on the causal criteria of analogy. Throughout history, one of the first responses to a communicable disease outbreak is to decrease the risk of exposure to the virus by removing the disease vectors (i.e., people) from the setting. Following this principle, cities and municipalities in Asia and Europe closed businesses and public spaces. Consequently, when the disease was identified in U.S. cities and businesses closed their doors to slow the spread and “flatten the curve,” this reflected the presence of infection in the population. These same disease mitigation strategies were undertaken during the initial SARS outbreak in 2003 and during the Ebola outbreaks in West Africa in 2014. Again, the decision by 24HF to shut down its business operations followed the principle of analogy that by de-densifying public settings, they could curtail ongoing spread and reduce the likelihood of further disease spreading in its clubs.
3. Biological Plausibility. That COVID-19 was spreading through person-to-person transmission was biologically plausible given the similarity of the SARS-CoV-2 virus to other respiratory viruses that cause the common cold, influenza and the initial SARS virus. Small virus particles are propelled through ordinary respiration (breathing) and propelled even further with vigorous respiration including exercising, coughing and sneezing. These viral particles are inhaled by people and animals breathing within the same geographic unit of space. Theoretically, if these viral particles remain alive on surfaces, they can additionally infect individuals who touch these surfaces and transfer the virus to their own respiratory track through the mouth, nose or even the eyes. Thus, the decision by 24HF to close was based on the biological plausibility that individuals inside their clubs were spreading the SARS-CoV-2 virus that causes COVID-19 by breathing together in close proximity.
4. Coherence. Once the SARS-CoV-2 virus was sequenced and could be studied further, there were experiments conducted to determine how long it could live on surfaces. Based on the observations that it could survive for hours to days (depending on the surface), scientists applied the criteria of coherence between laboratory and epidemiological evidence to suggest surface cleaning as a route of transmission. Unfortunately, however, it would have been impossible for 24HF to determine which surfaces in a given fitness



club were affected by SARS-CoV-2 and apply cleaning strategies alone to reduce transmission. Consequently, other mitigation strategies including shutdowns were more effective and the best possible decision at the time and in hindsight.

Much attention early on in the pandemic involved cleaning as a strategy to reduce transmission from surface to individual. A report in June 2020 indicated that the virus could remain alive for days on surfaces, and this sustained the commitment towards cleaning as a public health prevention strategy.<sup>60</sup> Whether or not surfaces containing the virus could readily be identified and subject to being cleaned, and what cleaning methods are appropriate, the CDC subsequently reported that surface transmission (i.e., “fomite”) is not the sole source of infection.<sup>61</sup> Instead, eliminating or decreasing the density of patrons breathing near one another indoors is the most effective strategy to prevent transmission. The closure of 24HF’s facilities in March 2020 appropriately and presciently adhered to best practices to prevent transmission that have continued to evolve but maintain that the central focus should be reducing opportunities for people to congregate indoors given airborne infectivity.

Tracking asymptomatic spread of the illness also was not possible in 2020 because there was limited testing capacity. However, asymptomatic and minimally symptomatic spread had been observed in other settings (Germany) and is highly likely to occur in someone feeling well enough to exercise.<sup>62</sup> The tests that were available were reserved for symptomatic individuals who presented in a hospital setting or individuals who had known exposures to a positive case. This scenario is very different than it is now in 2022, and even when sports leagues reopened in the summer and fall of 2020, repeated serial testing of asymptomatic persons was possible. Around that same time, there was considerable debate about the plausibility of asymptomatic spread within the CDC and WHO, who argued that prodromal or “pre-symptomatic” spread was more likely than asymptomatic spread. There was general agreement that an individual could still transmit the virus even if they were not actively showing symptoms but fell in the “prodromal” stage before symptoms appeared.

As indicated above, in my professional opinion, it was in 2020, and is today, reasonable for 24HF to conclude that COVID-19 was actually present and spread at all of its locations in March 2020. The decision by 24HF to close its locations for the reasons summarized was also reasonable and appropriate. Fitness clubs are high-exposure locations, where individuals congregate for longer periods in close quarters and undoubtedly release respiratory particles when exerting themselves during physical activities. The clientele attending exercise facilities, like 24HF club members, were at uniquely high risk of continuing to spread and contract SARS-CoV-2 because exercising

<sup>60</sup> van Doremalen N, Bushmaker T, Morris DH, Holbrook MG, Gamble A, Williamson BN, Tamin A, Harcourt JL, Thornburg NJ, Gerber SI, Lloyd-Smith JO, de Wit E, Munster VJ. Aerosol and Surface Stability of SARS-CoV-2 as Compared with SARS-CoV-1. *N Engl J Med*. Apr 16 2020;382(16):1564-1567.

<sup>61</sup> Meyerowitz EA, Richterman A, Gandhi RT, Sax PE. Transmission of SARS-CoV-2: A Review of Viral, Host, and Environmental Factors. *Ann Intern Med*. Jan 2021;174(1):69-79; Kampf G, Bruggemann Y, Kaba HEJ, Steinmann J, Pfaender S, Scheithauer S, Steinmann E. Potential sources, modes of transmission and effectiveness of prevention measures against SARS-CoV-2. *J Hosp Infect*. Dec 2020;106(4):678-697; Centers for Disease Control and Prevention. Science Brief: SARS-CoV-2 and Surface (Fomite) Transmission for Indoor Community Environments. Accessed August 10, 2022. <https://www.cdc.gov/coronavirus/2019-ncov/more/science-and-research/surface-transmission.html>.

<sup>62</sup> Rothe C, Schunk M, Sothmann P, Bretzel G, Froeschl G, Wallrauch C, Zimmer T, Thiel V, Janke C, Guggemos W, Seilmaier M, Drosten C, Vollmar P, Zwirgmaier K, Zange S, Wolfel R, Hoelscher M. Transmission of 2019-nCoV Infection from an Asymptomatic Contact in Germany. *N Engl J Med*. Mar 5 2020;382(10):970-971.



requires deep inhalation and exhalation to achieve adequate oxygen to perform. Exhalation by infected individuals and subsequent inhalation by uninfected individuals is the scientifically agreed upon primary route of transmission of SARS-CoV-2.

Further, due to the fact that individuals with the common cold, flu and other respiratory illnesses undoubtedly visited each 24HF location during the cold and flu season, it would have been untenable for 24HF to stay open as discussed. Surface cleaning would have been ineffective because there were too many surfaces to disinfect and no ability to determine which surfaces had SARS-CoV-2 on them. In the absence of available testing, it would have been impossible to discern infection from SARS-CoV-2 from the many common illnesses circulating at this time of year. Given that the average individual experiences 2-3 colds per year, there would have been many people with respiratory illnesses frequenting 24HF clubs during the winter and spring of 2020. To remain open would have run the risk of spreading SARS-CoV-2, particularly since most fitness centers were located in municipalities where community rates of COVID-19 were rising at a near exponential rate during that time.

24HF locations generally were in urban and suburban settings, in the vicinity of hospitals and other high-risk locations, with high rates of illness from COVID-19 and other respiratory illnesses present (**Figure 3**). Additionally, the facilities in those locations were highly trafficked. **Table 2** summarizes the average number of guests, workouts and personal training sessions accessed between January and March 2020. As reported to me by the company, members spend on average 40 minutes per session exercising. The volume of patrons and the time spent inside the clubs support 24HF's conclusion that COVID-19 was present and spreading at each of the 24HF locations up until the time the company decided to close in March 2020. In addition, there is no doubt that individuals with unspecified respiratory illnesses were present and these individuals had to be considered as having COVID-19. Without taking steps to close the clubs, it is reasonable to presume that COVID-19 would have continued to be present and spread, notwithstanding whatever cleaning regimen the company could have utilized. This is further evidenced by the fact that in some jurisdictions clubs were allowed to reopen but then were ordered to be closed again after a relatively short time period due to the continued re-introduction and spread of the virus.